

## Supplementary Online Content

Watkins K, Glomb NW, Trivedi TK, et al. Race, neighborhood disadvantage, and prehospital law enforcement handcuffing in children with behavioral health emergencies. *JAMA Netw Open*. 2024;7(11):e2443673. doi:10.1001/jamanetworkopen.2024.43673

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This supplementary material has been provided by the authors to give readers additional information about their work.

### **eMethods. Identifying the Primary Outcome, Handcuffing**

An initial emergency physician reviewer (T.T.) manually read all paramedic narratives that contained the term “cuff” in them ( $N = 812$ ). In these manually reviewed encounters, the term “handcuff” was used in a positive sense (“the patient was handcuffed”,  $N = 767$ ) and in a negative sense (“the patient was not handcuffed,”  $N = 45$ ). Encounters with narratives that did not contain the term “cuff” ( $N = 9,659$ ) were not manually reviewed during this phase; these encounters were automatically coded as negative for handcuffing.

Interrater reliability was assessed for the coding of handcuff use by EMS using Cohen's Kappa coefficient. To validate the coding scheme and algorithm developed by the initial reviewer (T.T.), 2 additional raters (a pediatric emergency physician, S.L., and a pediatric psychologist, M.R.) were trained on using the simple coding scheme (“0” for no handcuff application and “1” for handcuff application) during a bimonthly research group meeting. The 2 additional reviewers (S.L. and M.R.) independently evaluated a 20% sample ( $N = 2100$ ) of all BHE encounters ( $N = 10,471$ ) and coded for the presence or absence of handcuffs. Additional reviewer responses were compared to the initial reviewer responses.

<b>eTable 1. Unique Patient Visits with Race</b>	
<b>Characteristic</b>	<b>Unique Patient Visits (%), N=3,938</b>
Asian	458 (11.6)
Black	1 035 (26.3)
Hispanic <sup>a</sup>	502 (12.8)
Other	1 066 (27.1)
White	877 (22.2)
<sup>a</sup> Hospital records listed Hispanic ethnicity absent of race	

**eTable 2. Sensitivity Analyses using First Encounter, Missing Included as White & Random Assignment: Association of Race, Area Deprivation Index (ADI), Sex, and Age on Handcuffing Outcome**

Characteristic	Adjusted Model* Handcuffing, OR (95% CI)
<b>Missing Race replaced as White</b>	
<b>Race and Ethnicity</b> (reference = White)	
Asian	0.26 (0.12-0.60)
Black	1.50 (1.12-2.02)
Hispanic	0.68 (0.42-1.10)
Other	0.90 (0.65-1.27)
Characteristic	Adjusted Model* Handcuffing, OR (95% CI)
<b>Missing Race replaced as Random Race</b>	
<b>Race and Ethnicity</b> (reference = White)	
Asian	0.98 (0.64-1.50)
Black	1.48 (1.04-2.11)
Hispanic <sup>a</sup>	1.09 (0.72-1.64)
Other <sup>b</sup>	1.13 (0.79-1.64)
<b>ADI Category<sup>c</sup></b>	
I (lowest disadvantage)	Reference
II	1.60 (1.22-2.11)
III (highest disadvantage)	2.29 (1.68-3.12)

\*Final Model was adjusted for all other variables including age, sex, and ADI Category

<sup>a</sup>Hospital records listed Hispanic ethnicity absent of race

<sup>b</sup>Amerasian, Arab-American, Guamanian, Hawaiian, Native-American, Other Non-White, Pacific Islander, and Russian, Samoan

<sup>c</sup>Area Deprivation Index: Decile-based rank based on neighborhood-level characteristics from housing quality, education, employment, and income domains; Rank ranges from 1 to 10, 1= lowest neighborhood disadvantage & 10 = highest neighborhood disadvantage;

ADI I = ranking 1-3= lowest neighborhood disadvantage, ADI II = ranking 4-6, ADI III = ranking 7-10=highest neighborhood disadvantage


eFigure. N-gram Data Linkage Process

## Phase 1 Data Identifiable

## Phase 2 Merge Process (Single Day Process)

## Phase 3 Final Dataset Not Identifiable

Alameda  
County EMS



UCSF Benioff



Willow Rock



1) 2 Databases are Linked by Date of Birth and Name

Records in the EMS Database		Records in the Willow Rock/UCSF Database to be Merged		
Name	Date of Birth	Date of Birth	Name	Race
John Deering	1/1/2000	1/1/2000	John Deerings	White
Jane Doe	12/12/2012	12/12/2012	Jane Deer	Black
Tarak Trivedi	6/6/2004	6/6/2004	Joshua Brown	Asian

2) Two Databases are joined by Date of Birth, creating a database of possible matches

Date of Birth	Name (EMS data)	Name (Merged Data)	Potential Race	Similarity Score*
1/1/2000	John Deering	John Deerings	White	0.95
12/12/2012	Jane Doe	Jane Deer	Black	0.43
6/6/2004	Tarak Trivedi	Joshua Brown	Asian	0

3) Only records with Similarity Scores\* > 0.6 are considered matches, and Random Identifier Assigned

Date of Birth	Random Identifier	Name (EMS data)	Name (Merged Data)	Merged Race
1/1/2000	#14578	John Deering	John Deerings	White

4) Unique Identifier Added, and Names/Dates-of-Birth Permanently Deleted from Database

Random Identifier	Merged Race
#14578	White

\*The N-gram method provides a way to algorithmically quantify the similarity exhibited by two strings. The cut-offs were very stringent, requiring a similarity score of 0.6 or higher to be considered a match

